Claims

1. A reflective display comprising an anti-reflection coating on a viewed surface of the display, the anti-reflection coating being configured to increase the contrast ratio of the display.

2. The display of claim 1 comprising interferometric modulators.

3. An arc-lamp structure comprising a monolithic fabrication on a planar substrate, the fabrication comprising deposited thin films and/or a material of the substrate, the fabrication including thin film electrodes between which an arc is to be formed.

4. A transmissive or reflective display device incorporating the arc-lamp structure of claim 3.

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5. A line-at-a-time electronic driving method comprising

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applying a bias voltage to rows (or columns) of a device,

applying data voltages to the columns (or rows) alternately about a value of the bias voltage,

actuation of the device occurring when the difference between the values of the data voltage and the select voltage is above a first predetermined level,

release of the device occurring when the difference between the values of the data voltage and the select voltage is below a second predetermined level lowest, and

the device maintaining its state when the select voltage is at the bias level.

2. ~~6~~. The method of claim ~~5~~ 1 in which the device comprises multiple MEMS devices.

7. Apparatus comprising

a reflective display comprising pixel elements each configured to contribute a controlled amount of white and saturated color, and

a controller that controls the pixels to provide a full-color display.

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8. The apparatus of claim 7 in which the display comprises interferometric modulators.

9. An electronic product comprising

a core non-general-purpose processor that is reconfigurable to perform any selected one or more of multiple software applications or functions, and

a control element that enables a user to reconfigure the processor to use any of the software applications or functions.

10. The electronic product of claim 9 further comprising peripherals, the peripherals being used or reconfigured or made accessible for interaction based on a configuration of the core processor.

11. An interferometric modulator comprising

a cavity that provides for actuation of the modulator, and

a separate cavity that provides an interference effect.

12. An interferometric modulator comprising a structure associated with actuation of the modulator, and

an interferometric cavity having walls,

the structure being obscured by at least one of the walls of the interferometric cavity.

13. An interferometric modulator comprising

a thin film stack, and

a structure associated with actuation of the modulator, the structure being deposited directly upon the thin film stack, interference of the structure and the stack causing the stack to reflect minimal amounts of light.

14. An interferometric modulator comprising

a movable wall that

is configured as a spiral by induced residual stresses, in one mode of operation, and

is un-rolled to form a plate which acts interferometrically on light in another mode of operation.

15. A monolithic MEM modulator comprising

a movable plate that is held on a supporting substrate and

is configured to selectively obstruct a path of light,

is movable rotationally, about a hinge, in a plane normal to a surface of the supporting substrate, and

is actuated by electrostatic forces applied between it and electrodes at the surface of the substrate.

16. The modulator of claim 15 wherein colors or dark states are imparted by the interferometric properties of thin film stacks deposited on the modulator structure.

17. A micromechanical switch comprising

a supporting substrate, and

a movable component that effects switching by motion in a plane parallel to a plane of the substrate.

18. The switch of claim 17 wherein the movable component provides electrical contact between a source and a drain.

19. The switch of claim 17 wherein the movable component includes an insulating element.

20. A voltage switching or logic component that includes the switch of claim 17.

21. An electronic or MEMS-based device that incorporates the voltage switching or logic component of claim 20.

22. A dynamic micromechanical structure comprising a structure having an index of refraction that varies in a periodic fashion along more than one of at least two orthogonal axis.

23. A device for processing light comprising the micromechanical structure of claim 22.

24. The device of claim 23 configured to select and/or redirect specific frequencies of light from a waveguide that is propagating multiple light frequencies.

25. The device of claim 24 wherein a movable portion of the structure is configured to introduce a defect into a periodic photonic structure.

26. The device of claim 24 wherein the movable portion of the structure is configured to move a multi-dimensional photonic structure to change overall optical properties of the device.

27. A process for fabricating multi-dimensional photonic structures in conjunction with microelectromechanical structures, the process comprising

holographic patterning or polymeric self-assembly processes or self-organizing particle suspensions.

28. A process for introducing defects into multidimensional photonic structures, the process comprising

using a beam of atomic or sub-atomic particles to modify part of the photonic structure, by the addition or removal of material, by alteration of optical properties of a material or, by using micro-electrodeposition to add material.

29. A process for introducing defects into a multidimensional photonic structure, the process forming features on surface of a substrate, the features configured to provide locations for development of defects in a later formed photonic structure.

30. A device comprising

a substrate,

an interferometric modulator fabricated on the substrate, the interferometric modulator configured to modulate light propagating within the substrate upon which it is fabricated, in a direction that is generally parallel to the surface of the substrate.

31. A device comprising a substrate and a metalllic MEM structure formed on the substrate, the MEM structure being configured to modulate light that is propagating as guided waves.

32. The modulator of claims 30 and 31 configured to function as a variable attenuator.

33. A dynamic micromechanical structure comprising a substrate, and a reflecting optic on the substrate, the reflecting optic when actuated, re-directing light which is incident upon it and is propagating within the substrate, towards another optical structure.

34. A static microfabricated structure comprising a substrate and a mirror fabricated on or in close proximity to the substrate, the mirror being configured to redirect light that is incident upon it and is propagating within the substrate.

35. An optical switch comprising

a dynamic micromechanical structure comprising a reflecting optic and a fixed micro-structure incorporating a reflecting optic,

the two structures being fabricated on opposite sides of a substrate/waveguide,

the reflecting optics being oriented such that when a beam of light propagating within the substrate/waveguide is incident upon the dynamic structure in an actuated state, the optical path of the combined reflecting optics allows the path of the light's propagation within the substrate/waveguide to be altered arbitrarily.

36. The device of claim 34 wherein the reflecting optic comprises a mirror.

37. The device of claim 33 configured to couple light into or out of the substrate.

38. An optical device comprising

micromechanical structures configured to process light is propagating within a substrate/waveguide, and an optical or electronic device configured to thereafter intercept or manipulate the light.

39. An optical device of claim 37 further comprising anti-reflection coatings configured to couple and decouple light into and out of the substrate/waveguide.

40. The optical device of claim 38 further comprising an optical superstructure that is capable of supporting a combination of static microfabricated components, dynamic micromechanical components, and electronic components, and that is attached to the substrate/waveguide.

41. An optical path repositioning device comprising a patterned block of dielectric material deposited upon the surface of a substrate/waveguide.

42. The device of claim 37 wherein the micromechanical structures comprise a tunable filter.

43. An N X N optical switch comprising the devices of claims 33, 34, or 37.

44. A wavelength selective switch comprising the devices of claims 33, 34, or 37.

45. An optical mixer comprising the devices of claims 33, 34, and 37.

46. A process for fabricating micromechanical structures comprising

feeding a continuous web of a plastic supporting substrate through a series of tools for depositing, patterning, and etching deposited films.

47. A method of measuring a residual stress of deposited materials that comprise an interferometric cavity which is deformed by the deposition of the materials to be measured, the method comprising determining the deformation of the microstructure by measuring a pattern of wavelengths of light reflected by the cavity.

48. The method of claim 44 further comprising automatically determining the stress of the deposited materials based upon the patterns of reflected light.

49. The method of claim 45 further comprising determining the residual stress of films during and after deposition.

50. A dynamic micromechanical structure comprising a a dielectric, metallic, or semiconducting film which is discontinuous, the optical properties of said film differing from those of a continuous film because of the discontinuity.

51 A dynamic micromechanical structure comprising a a dielectric, metallic, or semiconducting film which has been etched in such a way as to produce a continuous variation in the optical properties of the film through its depth.

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